Contractor's Report to the Board

Executive Summary

Statewide Waste Characterization Study: Results and Final Report

December 1999

Prepared under contract by:

Cascadia Consulting Group, Inc.
Sky Valley Associates, Inc.
Sheri Eiker-Wiles Associates
Pacific Waste Consulting Group
Veterans Assistance Network
E. Tseng and Associates
E. Ashley Steel

The complete study can be found on the Board's web page at http://www.ciwmb.ca.gov/Publications/default.asp?pubid=824.

California Environmental Protection Agency
Integrated Waste Management Board

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION AND OBJECTIVES

During 1999 the California Integrated Waste Management Board (CIWMB) conducted a statewide study whose primary objective was to obtain information on the types and amounts of materials still being disposed in the state. The first such study of this magnitude, it encompassed gathering data from the commercial, residential, and self-haul waste streams throughout California. No information was gathered on materials diverted from disposal through source reduction, recycling, or composting. The standard methods contained in the California Uniform Waste Disposal Characterization Method were used.

In addition, the study was designed to determine a defensible estimate of the amount of Rigid Plastic Packaging Containers (RPPCs) disposed in California. This information is needed to calculate the recycling rate for RPPCs, which is required by state law. Also, data was gathered on the types and quantities of commercial waste disposed by 26 different types of businesses and institutions. This data will be added to the CIWMB Waste Characterization Database to serve as a resource to local governments.

1.2 STUDY METHODOLOGY

For study purposes, the waste stream was divided into three sectors: residential, commercial, and self-haul. The residential sector was further sub-divided into single and multifamily subsectors, and the self-haul into residential and commercial subsectors. The state was divided into five regions based on similarity of demographics and geographic features. A statistically-derived number of samples was allocated to each region to ensure adequate representation. In each region, five disposal sites (landfills and transfer stations) were randomly selected as sampling sites for the single family residential and self-haul waste streams. Collections at these sites totaled 148 single family residential and 247 self-haul samples. A total of 1207 commercial generator and 80 multifamily residential samples were collected from randomly selected businesses and apartment complexes within the geographical areas surrounding the selected disposal sites. Waste sampling was divided between winter and summer to account for any seasonal variations in waste disposal patterns. Each sample was hand sorted and characterized using the 57 material types found in the California Uniform Waste Disposal Characterization Method, as well as eight specific RPPC categories identified for this study.

Additionally, vehicle surveys were used to estimate the portion of California's waste contributed by each of the residential, commercial, and self-haul sectors. The surveys were conducted at 24 of the 25 sites that were visited for disposal site sampling, and on the same days that sampling occurred. All vehicles bringing waste to the site during a pre-determined eight-hour period were surveyed. The generating sector represented by the waste was identified, and the net weight of each load was recorded. A total of 3,648 surveys were completed.

1.3 RESULTS

The data gathered during the sampling efforts was reduced and statistical analyses were performed in order to extrapolate the findings to statewide estimates. The Final Report includes detailed findings for the following areas:

- Disposed waste composition and tonnage for the state's overall waste stream and the commercial, residential, and self-haul sectors;
- Disposed waste composition and tonnage for 26 industry groups;
- Disposed waste composition and tonnage of both single-family and multi-family subsectors;
- Disposed waste composition and tonnage of commercial self-haul and residential self-haul subsectors;
- Disposed waste composition and tonnage for RPPCs.

The findings show that, statewide, the commercial sector comprises 48.8% of the waste stream, the residential sector (single-family plus multifamily) represents 38.1%, and the self-haul sector is responsible for the remaining 13.1 percent. The data also show that 377,010 tons of RPPCs are being disposed statewide, equating to 1.06% of the overall waste stream. Table ES - 1 depicts the estimated contribution to the overall waste stream of each sector. Figures ES - 1 through ES - 4 display the breakdown of the waste stream by nine major categories in the overall, as well as each of the main sectors sampled. Finally, Table ES - 2 lists the ten most prevalent materials in the overall waste stream, which account for nearly 65% of California's disposed waste, while Table ES - 3 provides a complete breakdown of the composition of the overall waste stream by material type.

Table ES - 1: Estimated Contribution of Each Sector to the Overall Disposed Waste Stream

	Est. Percent of Waste Stream	Est. Tons Statewide
Commercial	48.8%	17,358,359
Residential	38.1%	13,525,504
Single-family residential	*28.0%*	*9,955,739*
Multifamily residential	*10.0%*	*3,569,888*
Self-haul	13.1%	4,651,591
Commercial self-haul	*10.5%*	*3,739,696*
Residential self-haul	*2.6%*	*911,770*
Totals	**100.0%**	**35,535,453**

Source: 1999 vehicle survey findings applied to CIWMB Disposal Reporting System 1998 tonnage figures.

Table ES - 2: Top 10 Materials in the Overall Disposed Waste Stream

Material Type	Est. Pct.	Est. Tons	Cumulative Pct.
Food	15.7%	5,584,506	15.7%
Remainder/Composite Paper	9.6%	3,416,281	25.3%
Leaves & Grass	7.9%	2,808,692	33.2%
Remainder/Composite Organic	6.9%	2,453,912	40.1%
Lumber	4.9%	1,746,001	45.1%
Uncoated Corrugated Cardboard	4.6%	1,630,348	49.6%
Other Miscellaneous Paper	4.4%	1,565,454	54.0%
Newspaper	4.3%	1,521,186	58.3%
Film Plastic	3.9%	1,377,438	62.2%
Other Ferrous Metal	2.4%	866,716	64.6%

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Figure ES - 1: Material Classes in the Overall Disposed Waste Stream

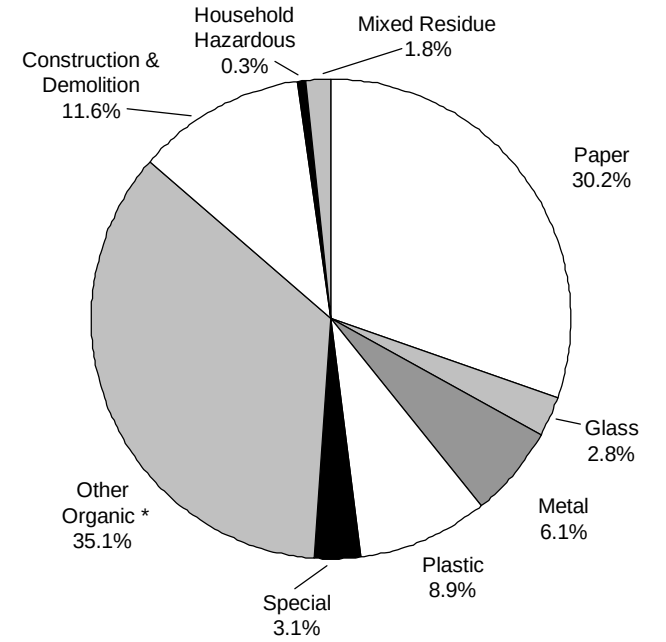


Figure ES - 2: Material Classes in the Commercial Disposed Waste Stream

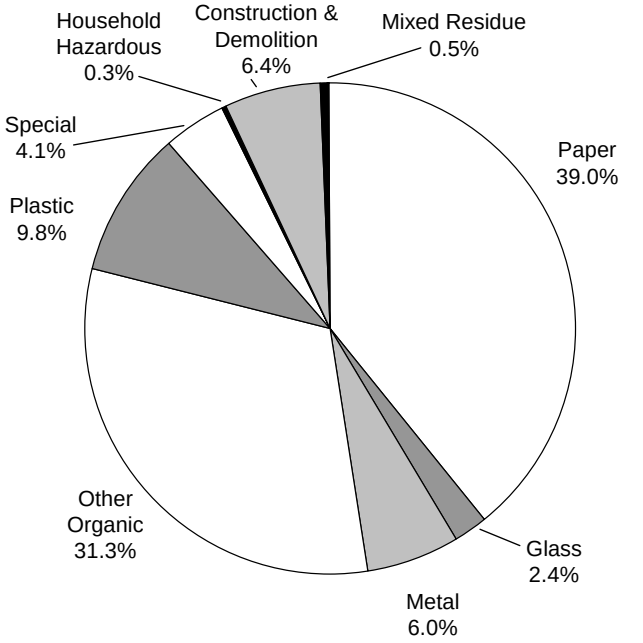


Figure ES - 3: Material Classes in the Residential Disposed Waste Stream

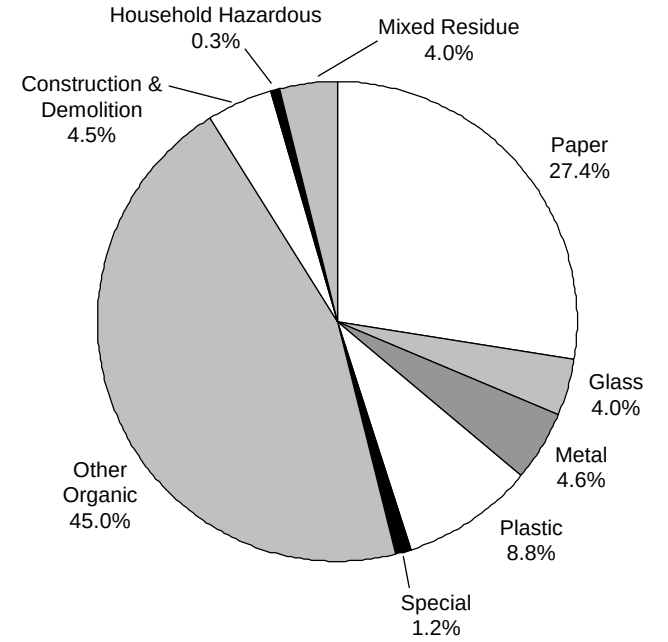
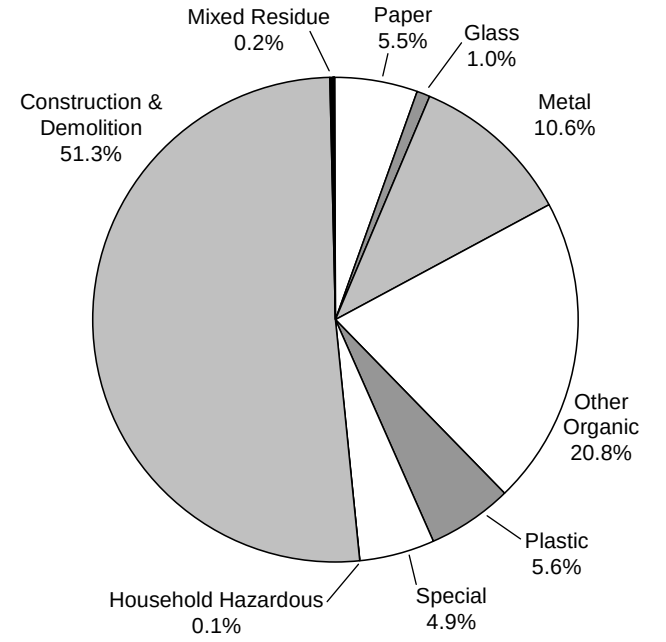


Figure ES - 4: Material Classes in the Self-Haul Disposed Waste Stream



* The class *Other Organic Waste* includes materials such as food, yard waste, textiles, carpet, and rubber.

Table ES - 3: Composition of the Overall Disposed Waste Stream by Material Type

	Est. Pct.	+ / -	Est. Tons
Paper	**30.2%**		**10,742,707**
Uncoated Corrugated Cardboard	4.6%	0.2%	1,630,348
Paper Bags	0.7%	0.0%	261,563
Newspaper	4.3%	0.3%	1,521,186
White Ledger Paper	2.3%	0.2%	812,752
Colored Ledger Paper	0.2%	0.0%	60,270
Computer Paper	0.3%	0.1%	114,545
Other Office Paper	1.7%	0.2%	591,080
Magazines and Catalogs	1.9%	0.1%	669,434
Phone Books and Directories	0.3%	0.1%	99,793
Other Miscellaneous Paper	4.4%	0.2%	1,565,454
Remainder/Composite Paper	9.6%	0.4%	3,416,281
Glass	**2.8%**		**1,011,441**
Clear Glass Bottles & Containers	1.4%	0.1%	506,214
Green Glass Bottles & Containers	0.4%	0.1%	154,191
Brown Glass Bottles & Containers	0.5%	0.0%	167,529
Other Colored Glass Bottles & Containers	0.0%	0.0%	6,859
Flat Glass	0.1%	0.0%	23,206
Remainer/Composite Glass	0.4%	0.1%	153,443
Metal	**6.1%**		**2,164,080**
Tin/Steel Cans	1.0%	0.1%	339,570
Major Appliances	0.1%	0.0%	23,257
Other Ferrous Metal	2.4%	0.3%	866,716
Aluminum Cans	0.2%	0.0%	87,086
Other Non-Ferrous Metal	0.3%	0.0%	93,548
Remainder/Composite Metal	2.1%	0.3%	753,903
Plastic	**8.9%**		**3,161,711**
HDPE Containers	0.8%	0.0%	275,944
PETE Containers	0.5%	0.0%	160,615
Miscellaneous Plastic Containers	0.7%	0.1%	239,954
Film Plastic	3.9%	0.2%	1,377,438
Durable Plastic Items	1.8%	0.2%	631,536
Remainder/Composite Plastic	1.3%	0.1%	476,224
Sample count: 1,682			

	Est. Pct.	+ / -	Est. Tons
Other Organic	**35.1%**		**12,490,171**
Food	15.7%	0.6%	5,584,506
Leaves & Grass	7.9%	0.7%	2,808,692
Prunings & Trimmings	2.2%	0.4%	790,727
Branches & Stumps	0.1%	0.1%	52,940
Agricultural Crop Residues	0.0%	0.0%	1,765
Manures	0.1%	0.1%	49,291
Textiles	2.1%	0.3%	748,336
Remainder/Composite Organic	6.9%	0.5%	2,453,912
Construction & Demolition	**11.6%**		**4,110,526**
Concrete	1.2%	0.2%	418,600
Asphalt Paving	0.1%	0.1%	49,614
Asphalt Roofing	0.7%	0.2%	252,254
Lumber	4.9%	0.5%	1,746,001
Gypsum Board	1.1%	0.2%	402,784
Rock, Soil & Fines	1.3%	0.3%	461,437
Remainder/Composite C&D	2.2%	0.3%	779,836
Household Hazardous Waste	**0.3%**		**106,497**
Paint	0.1%	0.0%	42,167
Vehicle & Equipment Fluids	0.0%	0.0%	13,596
Used Oil	0.0%	0.0%	1,579
Batteries	0.1%	0.0%	30,929
Remainder/Composite HHW	0.1%	0.0%	18,226
Special Waste	**3.1%**		**1,110,383**
Ash	0.1%	0.0%	21,464
Sewage Solids	0.0%	0.0%	0
Industrial Sludge	0.0%	0.0%	18
Treated Medical Waste	0.0%	0.0%	6,478
Bulky Items	1.8%	0.6%	656,509
Tires	0.4%	0.2%	145,899
Remainder/Composite Special Waste	0.8%	0.3%	280,017
Mixed Residue	**1.8%**	**0.2%**	**637,938**
Totals	**100.0%**		**35,535,453**

Confidence intervals calculated at the 90% confidence level. Percentages for materials may not total 100% due to rounding.